Fisher® *L2sj* Low Emission Liquid Level Controller

The rugged Fisher *L2sj* low emission liquid level controller uses a displacer type sensor to detect liquid level. This controller features a rugged, low emission proportional relay with integral action. The device delivers a direct acting on-off pneumatic output signal to a control/dump valve.

W9331

Features

- Designed for use with Natural Gas—The *L2sj* controller is intended for use with natural gas as the pneumatic supply.
- Increased Revenue—Reduced emissions result in an increase in natural gas available to the sales line.
- Reduced Operating Costs—Integral action relay with rugged metal seats requires less maintenance and provides more dependable liquid level control, which can improve uptime.
- Reduced Carbon Footprint—A low-bleed relay helps to conserve natural gas to reduce greenhouse gas emissions. The relay provides a steady state consumption rate that is less than the 6 scfh requirement set for the oil and gas industry by the US Environmental Protection Agency (New Source Performance Standards Subpart OOOO, EPA-HQ-QAR-2010-0505).
- NACE Service Ready—Sensor and vessel connection complies with the requirements of NACE MR0175-2002.
- Ease of Field Setup—Simplified dry and wet setup and adjustments. Setup and Adjustments illustrated inside L2sj cover as shown in figure 1.
- Field-Configurable Vertical or Horizontal Displacer—Displacer may be adjusted in the field for vertical or horizontal operation without additional parts.
- Vibration Resistant Sensor Dynamics— O-Ring friction and process pressure sensitivity are minimal. Performance stays constant with process pressure changes and controller remains vibration resistant.
- Low Supply Pressure—Can operate down to 0.34 bar (5 psi) instrument supply pressure for coal seam applications.

Specifications

Available Configuration

Controller: On-Off / Direct Acting
Sensor: Displacer-type liquid level sensor for mounting to side of vessel.

Input Signal

Liquid Level (gas over liquid)

Liquid Level Span(1)

See table 1

Minimum Specific Gravity

3 x 6 inch displacer: 0.6
1-7/8 x 12 inch displacer: 0.75

Output Signal

Control: Pneumatic On-Off
Range: 0 psi (off) or full supply pressure (on)
Action: Direct acting (increasing level increases output signal)

Supply Pressure Requirements

Any desired pressure between 0.34 and 2.4 bar (5 and 35 psig).

Supply Medium

Air or natural gas(2)

Steady-State Air Consumption(3)

< 0.01 normal m^3/hr (< 0.3 scfh) at 1.4 bar (20 psig) supply pressure

Sensor to Vessel Connection

■ 2 NPT threaded or ■ NPS 2 CL150 through 1500 slip-on flange connection

Controller Connections

Supply: 1/4 NPT internal located on the bottom of the case
Output: 1/4 NPT internal located on the top of the case

Case Vent: 1/4 NPT internal with vent screen assembly located on the back of the case

Displacer Size

■ 48 x 305 mm, 541 cm^3 (1-7/8 x 12 inches, 33 in^3)(4) or ■ 76 x 152 mm, 688 cm^3 (3 x 6 inches, 42 in^3)(5)

Displacer Insertion Length

See figure 2 and 3

Maximum Sensor Working Pressure(6)

PVC Displacer Consistent with CL1500 pressure temperature ratings per ASME B16.34 up to maximum pressure of 258.5 bar (3750 psig)
For PED (97/23/EC) maximum pressure limited to 200 bar (2900 psig)

S31603 SST Displacer: CL600 pressure temperature ratings per ASME B16.34 up to maximum pressure of 99.3 bar (1440 psig)

Note: For slip-on flange connection, maximum sensor working pressure must be consistent with the flange ratings

Sensor Temperature Limits(6)

PVC Displacer: -29 to 79°C (-20 to 175°F)

S31603 SST Displacer: -40 to 204°C (-40 to 400°F)

Operative Ambient Temperature Limits(6)

Controller: -29 to 71°C (-20 to 160°F)

Standard Supply, and Output Pressure Gauge Indications

Triple scale gauges in 0 to 60 psig / 0 to 0.4 MPa / 0 to 4.0 bar

-continued-

Specifications (continued)

Hazardous Area Classification

Complies with the requirements of ATEX Group II Category 2 Gas and Dust

CE ⟨Ex⟩ II 2 G D

Declaration of SEP

Fisher Controls International LLC declares this product to be in compliance with Article 3 paragraph 3 of the Pressure Equipment Directive (PED) 97 / 23 / EC. It was designed and manufactured in accordance with Sound Engineering Practice (SEP) and cannot bear the CE marking related to PED compliance.

However, the product *may* bear the CE marking to indicate compliance with *other* applicable European Community Directives.

NOTE: Specialized instrument terms are defined in ANSI/ISA Standard 51.1 - Process Instrument Terminology.
1. Level change required for full change in output signal.
2. This product can be used with natural gas as the supply medium. Natural gas should contain no more than 20 ppm of H_2S.
3. Normal m^3/hr - Normal cubic meters per hour (0°C and 1.01325 bar, absolute) Scfh - Standard cubic feet per hour (60°F and 14.7 psia).
4. Supplied with one 6 inch extension.
5. Supplied with one 3 inch extension.
6. The pressure and temperature limits in this document and any applicable standard or code limitation should not be exceeded.

Table 1. Liquid Level Span

SENSOR	SPECIFIC GRAVITY OF LIQUID		
	0.6	0.75	1
Vertical Displacer	**Span, mm (Inch)**		
1-7/8 x 12 inch Displacer with 6 inch extension	n/a	135 (5.3)	102 (4.0)
3 x 6 inch Displacer 3 inch extension	57 (2.25)	46 (1.8)	35 (1.35)
Horizontal Displacer	**Span, mm (Inch)**		
3 x 6 inch Displacer with 3 inch extension	22 (0.85)	17 (0.67)	13 (0.5)

Notes
1. Level change required for full change in output signal.
2. Span adjuster set for maximum sensitivity.
3. 1.4 bar (20 psig) supply pressure.
4. For vessels with fast dump cycles, actual liquid span will be larger

Figure 1. Setup and Adjustments Label (Inside Fisher L2sj Cover)

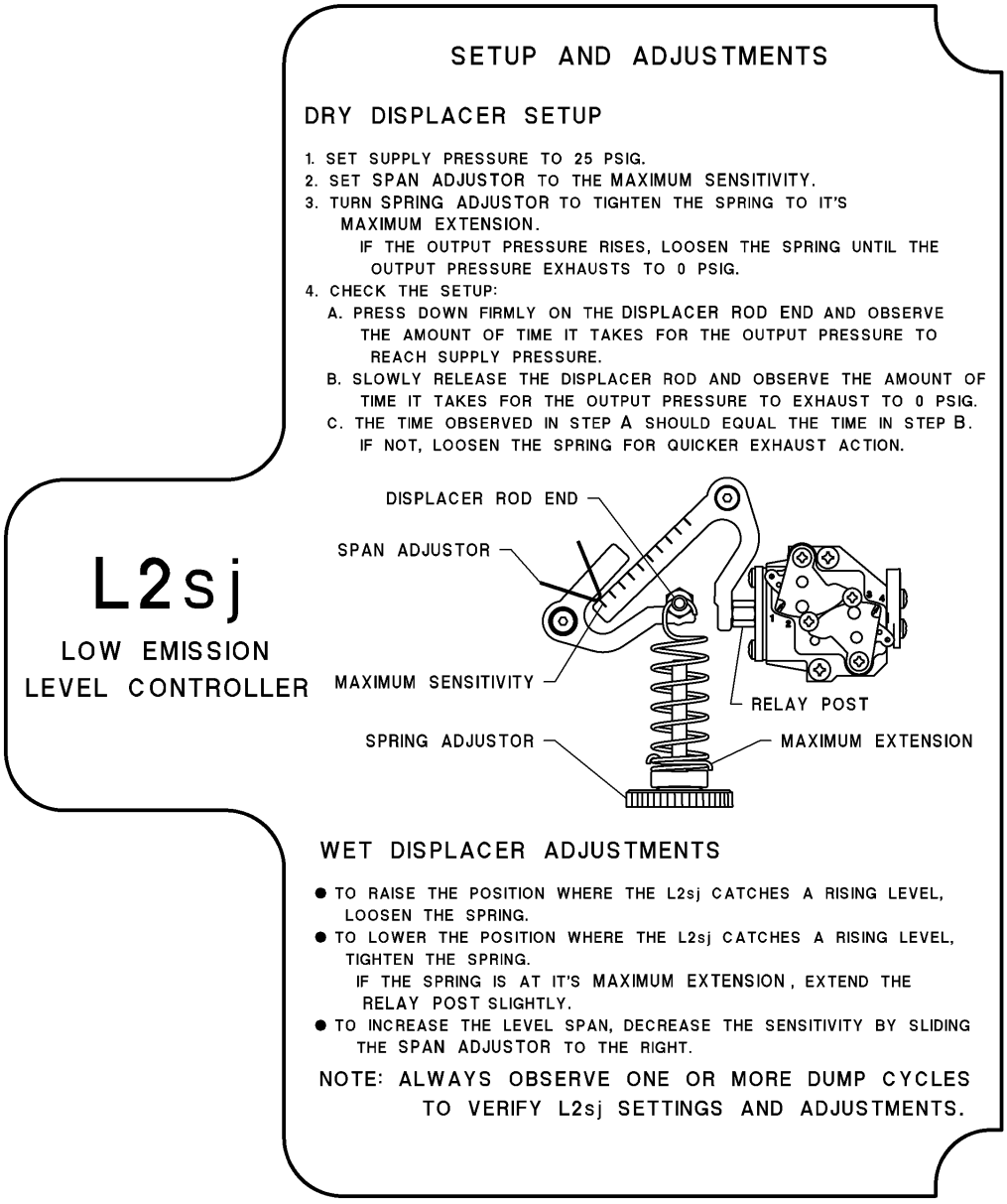

SETUP AND ADJUSTMENTS
DRY DISPLACER SETUP
1. SET SUPPLY PRESSURE TO 25 PSIG.
2. SET SPAN ADJUSTOR TO THE MAXIMUM SENSITIVITY.
3. TURN SPRING ADJUSTOR TO TIGHTEN THE SPRING TO IT'S MAXIMUM EXTENSION.
IF THE OUTPUT PRESSURE RISES, LOOSEN THE SPRING UNTIL THE OUTPUT PRESSURE EXHAUSTS TO 0 PSIG.
4. CHECK THE SETUP:
A. PRESS DOWN FIRMLY ON THE DISPLACER ROD END AND OBSERVE THE AMOUNT OF TIME IT TAKES FOR THE OUTPUT PRESSURE TO REACH SUPPLY PRESSURE.
B. SLOWLY RELEASE THE DISPLACER ROD AND OBSERVE THE AMOUNT OF TIME IT TAKES FOR THE OUTPUT PRESSURE TO EXHAUST TO 0 PSIG.
C. THE TIME OBSERVED IN STEP A SHOULD EQUAL THE TIME IN STEP B. IF NOT, LOOSEN THE SPRING FOR QUICKER EXHAUST ACTION.
L2sj
LOW EMISSION
LEVEL CONTROLLER
DISPLACER ROD END
SPAN ADJUSTOR
MAXIMUM SENSITIVITY
SPRING ADJUSTOR
RELAY POST
MAXIMUM EXTENSION
WET DISPLACER ADJUSTMENTS
● TO RAISE THE POSITION WHERE THE L2sj CATCHES A RISING LEVEL, LOOSEN THE SPRING.
● TO LOWER THE POSITION WHERE THE L2sj CATCHES A RISING LEVEL, TIGHTEN THE SPRING.
IF THE SPRING IS AT IT'S MAXIMUM EXTENSION, EXTEND THE RELAY POST SLIGHTLY.
● TO INCREASE THE LEVEL SPAN, DECREASE THE SENSITIVITY BY SLIDING THE SPAN ADJUSTOR TO THE RIGHT.
NOTE: ALWAYS OBSERVE ONE OR MORE DUMP CYCLES TO VERIFY L2sj SETTINGS AND ADJUSTMENTS.
GE16844

Figure 2. Dimensions: 76 x 152 mm (3 x 6 inches) with 76 mm (3 Inch) Extension

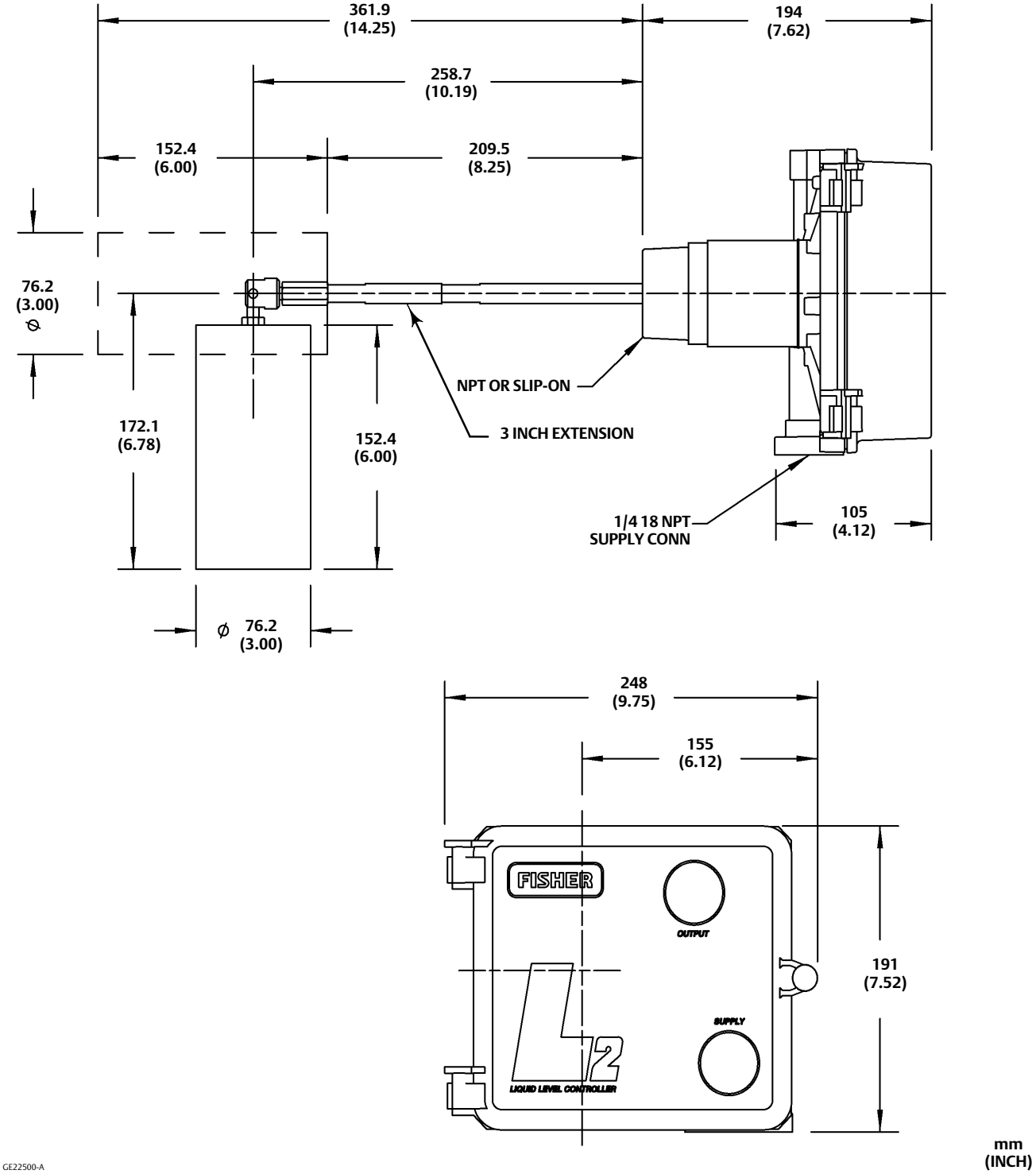
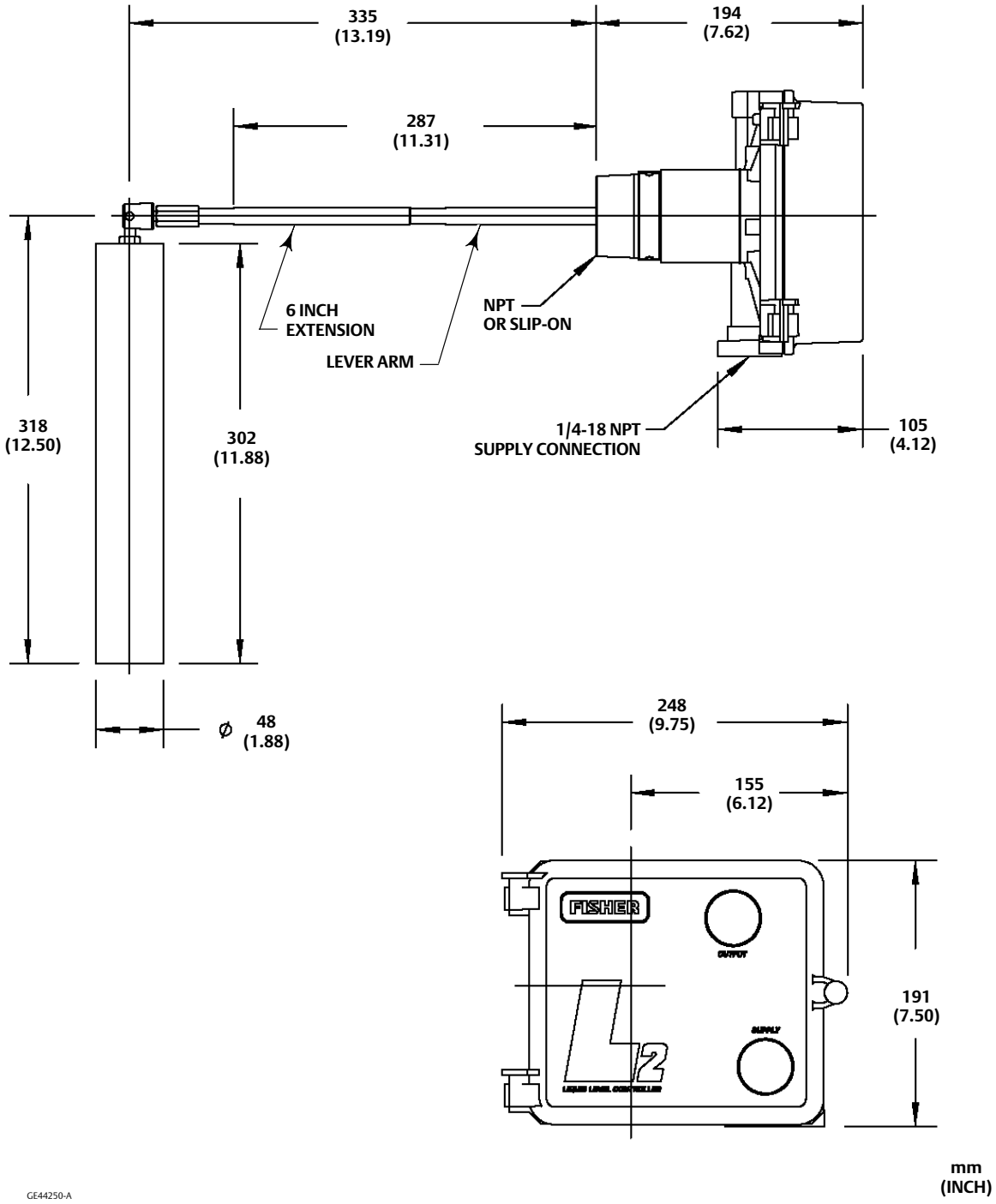


Figure 3. Dimensions: 48 x 305 mm (1-7/8 x 12 inches) with 152 mm (6 Inch) Extension



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